Original article

EVALUATION OF PROGNOSTIC SIGNIFICANCE OF HAEMATOLOGICAL PARAMETERS IN PULMONARY TUBERCULOSIS.

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ABSTRACT:

INTRODUCTION: Tuberculosis is one of the oldest disease and affected globally involving lungs but also studies have shown that tuberculosis affects bone marrow which causes significant haematological abnormalities These haematological changes acts as a potential marker for the diagnosis and persistent excretion of acid fast bacilli,which is associated with failure of these indices to return to normal.In addition ,these changes have correlation with severity of clinical findings of pulmonary tuberculosis.

AIMS AND OBJECTIVES:To evaluate haematological parameters among pulmonary tuberculosis patient.

MATERIALS AND METHODS:This is a case control study was carriesd out for a period of 1year from January 2018 to April 2019. A total of 50 patients who are diagnosed with Pulmonary Tuberculosis were taken up as cases. The control group consisted of 50 healthy individuals who were selected by purposive sampling. About 2 ml EDTA tube was used for haematological analysis. Sysmex haematology analyser with 6 part as well as peripheral smear

examination was used for analysis. The remaining 2 ml of blood was used for determining ESR by westergren tube method.

RESULTS: Present study showed reduced Haemoglobin,RBC count,PCV,MCV,MCH&MCHC in case group compared to control which is statistically significant (pvalue-<0.05). Also showed increase in WBC count,ESR in case group compared to control group which is statistically significant (pvalue-<0.05)

CONCLUSION:Haematological parameters helps in providing deeper insides into clinical prevention and management of the haematological risk factors in Tuberculosis and also theses parameters acts a potential markers with respect to the management of tuberculosis in order to derive candid guidelines for clinical case management

KEY WORDS:Tuberculosis,haematological Parameters,Risk factors,ESR

INTRODUCTION:

Tuberculosis is a major public health problem in India having wide variety of hematological manifestations.[1] There are many new diagnostic modalities and treatments have been introduced still ,it remains one of the major cause of death both in developing and developed countries.[1] According to WHO approximately 10 million people each year are infected and 1.9million people develop Tuberculosis every year. In the last 5 years,it has been observed that with single etiological agent ,ranking above HIV /AIDS.[2]

The bacteria responsible for tuberculosis is mycobacterium bacilli which affects many organs in the body.2 Pathogenesis of the disease is explained mainly by cell mediated immune response and also there is a crucial role of T cell lymphocytes in patients with cavitatory lesions where patients are usually sputum smear positive which is the prime source of infection.[1,2] The Cough droplets of such patients are infective in nature and approximately 3,000 droplet nuclei remains in the air for a prolonged period of time. [3]

During infection host immunity plays an important role in host pathogen interaction. Here neutrophils migrate early on the site of infection followed by monocytes,which can be differentiated into macrophages.[4] These macrophages present in mycobacterium tuberculosis

produces antigen to T lymphocyte which is a type of white blood cell.theses response are responsible for clinical manifestation of tuberculosis.[3,4]

There are many studies which have demonstrated the haematological abnormalities in pulmonary tuberculosis. Leucocytosis,monocytosis,lymphocytosis,thrombocytosis, lymphopenia and anemia are usually reported.[5] These haematological changes acts as a potential marker for the diagnosis and persistent excretion of acid fast bacilli,which is associated with failure of these indices to return to normal in addition ,these changes have correlation with severity of clinical findings of pulmonary tuberculosis.[4,5]If clinical laboratory interpret these haematological parameters carefully,it can be useful in assessing diagnosis and prognosis at a low cost.Therefore this study is undertaken to evaluate all the haematological parameters among pulmonary tuberculosis.

AIMS AND OBJECTIVES:

To evaluate haematological parameters among pulmonary tuberculosis patient

MATERIALS AND METHODS:

This is a case control study was carriesd out in out patient facility of the department of Medicine of our tertiary care hospital for a period of 1yearfrom January 2018 to april 2019. A total of 50 patients who are diagnosed with pulmonary tuberculosis were taken up as cases. The control group consisted of 50 healthy individuals who were selected by purposive sampling.

Inclusion criteria: Adults aged above 18 yrs of age belonging to both the genders with confirmed diagnosis of tuberculosis were included.

Exclusion criteria: Pregnant woman, pediatric cases and patients without confirmative diagnosis were excluded.

For control group all healthy adults who did not have any past or current history of tuberculosis were included in this study. Clinical details was used to record background information and personal history of the study participants.

About 4ml of venous blood was collected with aseptic precaution. About 2 ml EDTA tube was used for haematological analysis. Sysmex haematology analyser with 6 part as well as

peripheral smear examination was used for analysis. The remaining 2 ml of blood was used for determining ESR by westergreen tube method.

Data was entered and analysed using SPSS version 20 software.Prevalence of haematological abnormalities between the groups was expressed as percentages.The association between haematological parameters was analysed using chi square test.A p value <0.05 was considered statistically significant

RESULTS :

Total of 50 newly diagnosed tuberculosis patients 50 healthy control were included in the study. Common age in case group ranges between 21-30 years (30%) and control group shows 51-60 years (25%) was common. Shown in Table 1

Table 1: Age wise distribution between case group and control group

Age in years	TB Cases group	Control group
18-20	02 (04%)	O5(10%)
21-30	15 (30%)	06(12%)
31-40	10 (20%)	08(16%)
41-50	10 (20%)	10(20%)
51-60	05 (10%)	13(25%)
61-70	06 (12%)	05(10%)
>70	02 (04%)	03 (07%)

In the present study males were common both in case group and control group that is 62% and 58% respectively.shown in Table 2

Table 2: Sex wise distribution in case group and control group

Sex	TB Cases group	Control group
Male	31(62%)	29(58%)
Female	19(38%)	21(42%)

Table 3: Haematological parameters distribution in case group and partial group

Haematological parameters	Case group Mean± SD	Control group Mean ±SD	P value
WBCX10^3 cells/µl	11.84 ±10.54	8.27 ±1.50	<0.05
RBCX10^6 cells/µl	5.1±1.54	4.47 ±0.35	<0.05
Hb g/dl	10.4±1.9	12.20± 0.5	<0.05
PCV%	36.8±4.6	37.90± 5.6	<0.05
MCVfl	75.07±5.9	82.67 ±5.2	<0.05
MCHpg	28.02±3.1	30.20±1.8	<0.05
MCHCg/dl	31.9±2.1	33.90± 1.8	<0.05
PLTx10^3cells/µl	325±171.4	221.70± 81.7	<0.05
ESRmm/hr	42.70±35.61	14.34 ± 4.30	<0.05
Neutrophils%	40.35±10.25	42.45 ±3.0	<0.05
Lymphocytes%	35.70±12.88	31.62 ±4.10	<0.05

The haemoglobin ,PCV,RBC count,MCV,MCH and MCHC values were significantly lower in cases group compared to control group and were found to be statistically significant. The platelet count was within normal range, the count was significantly lower among the case group compared to control group .The total leucocyte count ,ESR values were signicantly higher in both case group compared to control group .and the difference was statistically significant.The percentage of lymphocytes was within normal range it was significantly higher in case group compared to control group.also neutrophils were within normal range between the 2 groups shown table 3.

DISCUSSION

Tuberculosis is one of the oldest disease and affected globally involving lungs but also studies have shown that tuberculosis affects bone marrow which causes significant haematological abnormalities.

In the present study shows decrease in haemoglobin, RBC count, PCV,MCV,MCH and MCHC which was similar to the study done by shafee M et al[5] showed reduced RBC count and PCV, Atmosa D et al[6]. showed reduced haemoglobin,RBC count,MCV,MCH,MCHC probable reason

for the presence of anemia in tuberculosis is iron sequestration due to chronic inflammation and leads to decreased production of erythropoietin. Anemia is a common haematological finding in tuberculosis and majority of the patients in our study were males. Anemia was highly prevalent among both male and female with tuberculosis.

The present study showed an increase in toatal WBC counts among the cases group.Although the percentage of lymphocytes remain within the range , it was found to be significantly elevated in comparison with the controls.similar to the study done by Rohini K et al[7]. Leucocytosis is a cardinal feature of tuberculosis and also increase in lymphocytes may be due to bacteria entry into the body results in the production of cellular immunity

Present stuy demonstrated increased ESR which was in concordance with study done by chakraborti et al[8], Doedhare et al[9] and Hungund et al[10] . Elevated ESR is an indicatior of inflammation and severity of disease.

The present study showed platelet count was within normal range in majority of the cases the platelet count is decreased compared to control group which is similar to study done by Shafee M et al[5] and Rohini K et al.[7] Comparison of haematological findings in various studies showed platelet count was variable in different studies some showed thrombocytosis and others thrombocytopenia.Thrombocytosis is assumed to be due to increased thrombopoietic factors as an inflammatory response. Also varied mechanism like drug immune mechanisms, bone marrow fibrosis and hypersplenism are also causative factor for thromobocytopenia

CONCLUSION

In the present study patients were from lower socio economic status, the presence of inherent risk factors like nutritional status and other social risk factors including smoking and alcohol were higher among the case group . The biological association of these risk factors shows the haematological parameters can be used as an indicator in the diagnosis and follow up of Tuberculosis.

Haematological parameters also helps in providing deeper insides into clinical prevention and management of the haematological risk factors in Tuberculosis and also theses parameters acts a

potential markers with respect to the management of tuberculosis in order to derive candid guidelines for clinical case management.

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